

NASA Lewis' Telescience Support Center Supports Orbiting Microgravity Experiments



Mission operations area of the Telescience Support Center.

The Telescience Support Center (TSC) at the NASA Lewis Research Center was developed to enable Lewis-based science teams and principal investigators to monitor and control experimental and operational payloads onboard the International Space Station. The TSC is a remote operations hub that can interface with other remote facilities, such as universities and industrial laboratories. As a pathfinder for International Space Station telescience operations, the TSC has incrementally developed an operational capability by supporting space shuttle missions. The TSC has evolved into an environment where experimenters and scientists can control and monitor the health and status of their experiments in near real time. Remote operations (or telescience) allow local scientists and their experiment teams to minimize their travel and maintain a local complement of expertise for hardware and software troubleshooting and data analysis.

The TSC was designed, developed, and is operated by Lewis' Engineering and Technical Services Directorate and its support contractors, Analex Corporation and White's Information System, Inc. It is managed by Lewis' Microgravity Science Division.

The TSC provides operational support in conjunction with the NASA Marshall Space Flight Center and NASA Johnson Space Center. It enables its customers to command, receive, and view telemetry; monitor the science video from their on-orbit experiments; and communicate over mission-support voice loops. Data can be received and routed to experimenter-supplied ground support equipment and/or to the TSC data system for display. Video teleconferencing capability and other video sources, such as NASA TV, are also available. The TSC has a full complement of standard services to aid experimenters in telemetry operations.

In fiscal year 1997, the TSC supported three missions and their associated simulations. In the past year, there have been many Lewis-sponsored microgravity experiments onboard the shuttles: The mission provided support for the Solid Surface Combustion Experiment (SSCE) on STS-85, and for the Space Acceleration Measurement System (SAMS), PI Microgravity Management Services team, Droplet Combustion Experiment (DCE), Combustion Module-1 (CM-1), Glovebox, Large Isothermal Furnace (LIF), Physics of Hard Spheres Experiment (PHaSE), and Orbital Acceleration Research Experiment (OARE) experiments on the STS-83/MSL-1 mission. STS-94 was a reflight of STS-83 and supported all of the experiments listed for STS-83. The STS-87/USMP-4 mission, which is scheduled for November 1997, includes support for SAMS, the PI Microgravity Management Services team, and the Isothermal Dendritic Growth Experiment (IDGE).

After STS-87/USMP-4 in November of 1997, the TSC will redirect all resources toward the upcoming International Space Station era. At that time, TSC equipment will undergo a major systems upgrade in preparation for incremental Space Station Utilization Flight 1 (UF-1) support. The TSC will support fluids, combustion, and microgravity environment experiments from NASA Lewis during the International Space Station era.

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